
SUCCESS HAS ITS CHALLENGES TOO!

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Introduction

It's a success story. Librarians at Indiana University-Purdue University Indianapolis (IUPUI) have been involved with the School of Sciences' SCI 120 Learning Communities for First-Year Students since their introduction in 1997. From curriculum development to teaching in the classroom, librarian expertise and experience has been valued and sought out. However, with this success comes challenges. How do we (the science librarians) manage the extensive time commitment required by these courses? How do we streamline the grading of library exercises? How can the instructional team members easily share instructional materials? As the title of the 2004 LOEX conference states, the IUPUI science librarians have been 'refocusing our response' to meet these challenges, and would like to share our ideas as well as experiences.¹

School of Science Learning Community History

IUPUI is an undergraduate/graduate degree granting institution located in downtown Indianapolis, Indiana. The University has embraced first-year learning communities as a way to increase student retention and prepare students for their academic experience. The SCI 120 learning community course is a required class for IUPUI School of Science majors. It is eleven weeks in length with a fall enrollment of approximately 150 students, divided into 7 sections. The course is designed to introduce students to the study of science and how to be successful in college and is taught by an instructional team consisting of: a faculty member, a librarian, an academic advisor, and a student mentor.

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From its inception, the instructional team concept of this learning community initiative took hold. Librarians were at the table with the other instructional team members developing the curriculum for the course. As a result, SCI 120 has targeted library competency components including library exercises aimed at: using the online catalog, navigating the library's physical space, recognizing appropriate periodical indexes, locating journal articles, distinguishing scholarly journal articles from popular magazines, determining credible Web site information, and citing information sources.

The Challenges

Our active involvement with this course, however, does carry a price. We found that since there were several different teams teaching the six to seven sections, sharing instructional materials across teams was becoming increasingly cumbersome as well as inefficient. While there was a SCI 120 handbook aimed at the study of scientific themes, which included library exercises, individual teams had the freedom to alter or create materials to meet their specific class needs and their teaching styles. We (librarians) did have a privately shared drive to store and access library instructional materials; however, the teams as a whole did not have a shared repository of instructional materials. Many times, the only way to access an exercise designed for a previous section of the class involved tracking down the original author of the exercise.

Also, we were discovering that the library exercises, while appropriate, were too lengthy for the students to complete in class. The exercises were suffering from the 'teach them as much as you can!' philosophy. They also emphasized individual work and contained reflective writing components. We found our time was being consumed by reading and grading

individual assignments that were not producing the types of reflective thought we were seeking; which may have been due to the students' cognitive level. This made grading a laborious task for us.

Finally, our in-classroom time was becoming more and more of an issue. At its inception, librarians were teaching four of the eleven class sessions. While this was a wonderful reflection of the value the School of Science placed on librarian involvement with the classes, this was inhibiting the science librarians' ability to get involved in other instructional initiatives on our campus.

Solution Part 1: Administrative Streamlining

• Web site for Instructional Materials

We decided to streamline our involvement on two fronts: administratively and instructionally. Administratively, the librarians actually stepped up our leadership role with this class by creating a SCI 120 Web site. The Web site serves as a repository of instructional materials for all components of the class, whether these are library instructional materials or class materials created by other team members. Team members forward updated instructional materials for the course to the SCI 120 Library Coordinator who uploads them for all to utilize. When instructional teams meet, they can easily access original and rewritten lesson plans and exercises for a particular class session from the Web site. This innovation has moved us from the 'let's reinvent the wheel' mentality that was occurring when teams met, in some instances weekly, to more time for creative assessment and preparation for each class session. Overall, the centralization of SCI 120 instructional material has streamlined the teams' preparation process.

A shared Web site has also eliminated the need to attach individual lesson plans and exercises within the course software used for the class sections. Now, within the course software, we simply link to the *student version* of the SCI 120 Web site (there is an instructor version, which includes materials the students do not see such as exercise keys, and a student version) and all student needed materials appear. Finally, the Web sites always provide a publicly accessible copy of course materials, anywhere on campus, deliverable to any desktop! This eliminates some printing needs as well.

On the front end, there was a large time commitment in creating the SCI 120 Web site; however, we feel, through its repository value, that it is saving us time. Plus, the upkeep of the site is less time intensive than the initial creation. To view the two Web sites go to: <http://mypage.iu.edu/~sarneal/> and <http://mypage.iu.edu/~sarneal/student.htm>

• Utilizing Course Software

A second administrative time saver and assessment tool that we incorporated into the class was to take advantage of our University's course software to administer our Library's online information literacy tutorial, INFLITE. It is important to note that the science librarians did not create the tutorial nor did we develop its incorporation into our University's course software. This was a project developed by Julie Moline, Visiting Librarian at IUPUI, now at Butler University, Indianapolis, Indiana. We simply took INFLITE and its accompanying quizzes, which matched our established course objectives, and let the course software do the assessment of learning for us! For example, our course software grades the tutorial quizzes and provides an instant statistical analysis of student answers, which is invaluable to assess student learning. The software allows us to set the number of times a student can take the tutorial quizzes and the time allotted for them, whether within a number of hours, days, a week, etc. We can control test feedback, that is, we can show students the right answers or simply point out those they did not answer correctly so they can attempt those quiz questions again. Finally, the course software allows us to reword quiz questions and manipulate the sequence of quiz questions, if needed.

Needless to say, using our Library's tutorial and accompanying quizzes is a huge grading time saver, especially when you are teaching multiple sections of the course. Plus, it enables us to keep an individual learning component to the library exercises. We have likewise found that the automating of the quizzes assists us in creating firm deadlines for the students. Remember, this is a class which indoctrinates students in how to be successful in college by meeting deadlines, budgeting one's time, etc. The automated deadlines assist us in carrying out these values.

Another unforeseen benefit of utilizing the course software for teaching is that it has enlightened the teams about other ways to use the course software to implement course activities. For example, we have incorporated a pre-assessment and post-assessment test of library knowledge and skills through the course software. This automated assessment is particularly powerful when we conduct the pre-assessment the first day of class. Not only can we instantly show students the questions they collectively struggle with, we can note that we will stress these concepts throughout the next eleven weeks. The automated pre-assessment/post-assessment test also provides us with handy statistics that demonstrates the continued need for course integrated library competencies.

• Classroom Time

The one challenge we have not solved with the SCI 120 learning communities is our in-classroom time. Presently, we are teaching six of the class sessions, up from four when the class was conceived. However, we believe our adjustments in the areas we have delineated: building a SCI 120 Web site to share materials, utilizing IUPUI's course software to deliver our Library's online tutorial and accompanying quizzes, and redesigning instructional materials, which will be explained shortly, alleviates this added classroom time.

In this classroom time dilemma, the science librarians at IUPUI are in a difficult yet positive quandary! Our contributions to the class are readily sought out and encouraged by the instructional teams. Plus, learning communities are built around the idea that students gain valuable insights and experiences when exposed to an instructional team of various academic persons on campus. Yet, the more involved we are with the class, the less time we have to expand our instructional efforts into other library instructional initiatives such as senior capstone (seminar) classes, graduate level courses, research methods courses, etc. It is great to be needed, but we will need to continue to assess our role and involvement in the course.

• Leadership

Our administrative changes have brought about another unforeseen benefit for the science librarians; we have assumed a greater leadership role in developing and co-teaching SCI 120. While leadership can be viewed as a time commitment, we sense it is actually helping us to control our time better. With administrative innovations such as the creation of the SCI 120 Web site and utilizing our University's course software to deliver instructional content, we are pushing our teams to make efficient use of limited time to deliver a quality learning experience for incoming students.

Solution Part 2: Instructional Streamlining

The second mode of attack for dealing with our challenges entailed developing clearly defined learning objectives for the library exercises and developing content changes as well as introducing various pedagogical approaches for these exercises. The original library skills lessons and exercises were on the right track, but with these changes, our time commitment in teaching them was lessened while enhancing student learning outcomes.

• Small Changes

At a very basic level, the librarians involved in teaching the courses made a commitment to making changes or revisions to the original instructional materials during the summer months when the course is not taught. This commitment kept us from the continual editing mode we were often in as the course was being taught. We also made a clear statement of principle learning objectives for each of the library lesson plans and outlined all the exercises. While this may be a pragmatic simple idea we had never done this in such a formal manner and it is greatly assisting us in avoiding the temptation to 'teach them everything!' Finally, we instituted a 12-question pre and post-test assessment to better assess student learning.

• Library Exercises – More Collaborative Learning

As we stated earlier concerning the challenges with the course, the library exercises were lengthy, contained reflective writing, and often involved individual work for completion. Yet, the concepts and skills the exercises taught were appropriate. So, we worked hard to redesign them to be carried out through cooperative learning and hands-on exercises. These changes resulted in student's enjoying the learning experiences more because they were interacting with other classmates, student's were acquiring and synthesizing library competencies, and our grading was lightened. It is important to note that when you have students work in this fashion, you as the instructor must be "on" during the class session. You must monitor the groups to keep them on target, have a reporting back session where the groups communicate their findings and require that the groups have a writer to record their findings and a spokesperson for the public reporting session. This way, by the end of the class session, you, as the instructor, can assess whether the students learned the material even before you grade their group submitted responses. Consult our SCI 120 Web site to view our collaborative exercises: <http://mypage.iu.edu/~sarneal/>

• Limiting Outside Class Assignments

Another goal for the library exercises was to limit outside-class library assignments. Evolving the exercises into more collaborative experiences forced us to have the students complete the work in class. This benefited the students (not as much take-home work!) and saved us grading time as well. One area we did not sacrifice for outside-class work was a self-guided, physical tour of the library. We felt this to be an

important learning objective: for students to learn the library as a physical space, so we still require this as outside work.

• Critical Thinking through Discussion

Another aspect of enhancing the library exercises in SCI 120 is the infusion of critical thinking elements into the revised exercises. Gone are the reflective writings but in their place are discussions as to *why* students chose the answers they did when we reconvene for public reporting after a particular collaborative exercise. Here, our aim is to encourage our students to feel like pre-professionals through scientific inquiry and creative thinking exercises.

• Library Online Tutorial Assesses Individual Learning

Group work is fun for the students and limits our time spent on grading class work; however, there is still a need for individual assessment of learning outcomes. Therefore, to assess individual competencies, we are taking advantage of our Library's information literacy tutorial. SCI 120 students complete three of the available six INFLITE modules on the following topics: Searching IUCAT (our online catalog), Finding Articles, and Using the Web. As we have pointed out, the University course software grades the accompanying quizzes, reducing our grading responsibilities. Go to <http://inflite.ulib.iupui.edu> to view the tutorial.

Conclusion

Because IUPUI values first-year learning communities as a way to acclimate students to the

college experience, the SCI 120 learning community will continue to be an instructional initiative involving science librarians. However, we hope the administrative and instructional changes we instituted into the course economizes the continued use of our time and expertise while maintaining our focus on the most important goal: student learning.

Appendix A and B

Included are abbreviated versions of two library exercises used in the class that highlight our use of collaborative learning. The first one, *Which Do I Cite?* was conducted during the presentation at the LOEX Conference with the help of audience volunteers. The second one, *Diversity in Science*, was outlined to the audience. The complete exercises are available at the SCI 120 Web site, the first URL listed under Notes.

NOTES

1. Besides the presentation's authors, IUPUI science librarians, Randi Stocker, Associate Librarian, and Randall Halverson, Assistant Librarian, are also involved in creating instructional materials, developing lesson plans, etc. for the SCI 120 course.

URLs

SCI 120 Instructor Web Site: <http://mypage.iu.edu/~sarneal/>

SCI 120 Student Web Site: <http://mypage.iu.edu/~sarneal/student.htm>

IUPUI University Library online tutorial, INFLITE: <http://inflite.ulib.iupui.edu>

APPENDIX A

Which Do I Cite? Analyzing Science-related Information Sources SCI 120 Windows on Science Session Eight

1.

Information source: Encyclopedia Britannica online

Information use: In a paper about Bill Gates for a Computing 1.

The information: He became a paper billionaire in 1986, and within a decade his net worth had reached into the tens of billions of dollars—making him by some estimates the world's richest private individual.

Must be cited _____ Can be used without a citation _____

Please explain your answer (2 points)

2.

Information source: Chemistry textbook and the CRC Handbook of Chemistry & Physics

Information use: You have looked up the molecular weights of hydrogen and oxygen several times – remembering the approximate atomic weights for these elements, you calculate the approximate mass per mole of H₂O (water) as 18 grams/mole. You use this value in a chemistry lab write-up.

The information: The atomic weight of H (hydrogen) \approx 1 atomic mass unit (amu)
The atomic weight of O (oxygen) \approx 16 amu.

Must be cited _____ Can be used without a citation _____

Please explain your answer (2 points)

4.

Information source: BIODIVERSITY and CONSERVATION, an online Hypertext Book

Information use: In a PowerPoint presentation for Fundamentals of Earth History, a geology class

The information: One theory to explain the extinction of the dinosaurs is the impact of a large object such as an asteroid or comet. Scientists believe that an impact significant enough to cause the extinction of the dinosaurs would produce a crater 100 miles across or larger. Evidence which supports this theory is provided by the Chicxulub crater, a crater 200 miles across and of the right age, recently found underwater off the coast of the Yucatan peninsula.

Must be cited _____ Can be used without a citation _____

Please explain your answer (2 points)

7.

Information source: TV Network News Interview with scientist

Information use: In your own words within a paper for a meteorology class

The information: The "Muncie Climatologic model" demonstrates that there are only 27 chances out of 100 that the worldwide phenomena of global warming measured since 1990 is entirely due to natural weather and climate fluctuations.

Must be cited _____ Can be used without a citation _____

Please explain your answer (2 points)

8.

Information source: From your introductory physics textbook – and other sources

Information Use: In a paper for your Undergraduate Reading and Research class

The information: The speed of light was defined in 1983 by international agreement as 299,792,458 meters per second.

Must be cited _____ Can be used without a citation _____

Please explain your answer (2 points)

APPENDIX B

SCI 120 Session Ten Understanding Society & Culture Library Competencies & PULs

Assessment. Review learning objectives from previous sessions.

Lesson. Coral Reefs: A Model of Scientific and Academic Diversity and Interactions.
“Diversity” of Science: Understanding Society and Culture.

Principle Learning Objectives:

1. Integration and application of knowledge as related to biological and ethnic diversity illustrated by the history of medicine.
2. Use of library biographical and historical reference sources in the pure and applied sciences.
3. To engage students in a critical thinking exercise regarding the concept of diversity.
4. To explore the diversity of practices and contributions in the medical sciences within the **Global Community**?

Materials:

Selected works from bibliography of selected biographies and histories of science.

Coral reef collage (video clip optional).

Handout initial individual response.

Handout initial group response.

Handout listing seven talking points.

Handout final individual response listing activity closure questions.

Vital Stats Handout

Definition of race and ethnicity.

Created by:
Robert Yost, IUPUI Department of Biology, & Edward González, IUPUI University Library
Spring 03

Activity:

WHAT DOES DIVERSITY MEAN IN THE CONTEXT OF THE SCIENCE?

Objective: Engage students in a critical thinking exercise regarding the concept of diversity.

Student Engagement (Group Dynamics):

Each student is asked to write their initial personal response to the question “*WHAT DOES DIVERSITY MEAN IN THE CONTEXT OF SCIENCE?*”

See materials. (5 minutes).

The exercise is repeated as an initial group response. See materials.

CORAL REEF: OBSERVATIONS

Objective: Engage students in an analytical exercise regarding the concept of **Biotic Communities** as a life science model of diversity.

Student Engagement

Individual exercise:

Present video clip (optional).

Each student is given a copy of the collage and is asked to write their observations. (5 minutes).

Instructor polls the students for their individual responses to collage and video, and lists them on the white board. (Instructional team member records responses on PC).

Group exercise:

Instructor briefly introduces (LISTS) seven talking points.

The exercise is repeated as a group activity. Teams are asked to designate a recorder as well as a spokesperson. Responses are listed on the white board for comparison with the individual responses. (5 minutes)

Instructor discusses and introduces model based on seven talking points.

MEDICAL SCIENCE TIMELINE

Objective: To explore the diversity of contributions and practices in the medical sciences within the **Global Community**?

Student Engagement:

Teams are asked to designate a recorder as well as a spokesperson.

Provide teams with library resources designed to develop a general timetable of significant events in the field of medicine and to identify historical and contemporary individuals with diverse backgrounds. (Prehistory to 799 AD, Medieval World 800-1491, Renaissance & Reformation 1500-1620, Changing World & Expansion 1770-1990, Modern World 1901-1946, and Science Post WWII to present and Nobel Prize)

Each team is asked to summarize on the white board significant milestones, vital statistics, and occupations for an assigned individuals. (10 minutes).

Each team will report their findings to the class to visually develop a timetable. (10 minutes)

ACTIVITY CLOSURE*

The students are asked one more time to reflect on the question: What does diversity mean in the context of science? The instructor then asks question(s) directly related to the activity. See materials, "Handout final individual response listing activity closure questions.")

Have you changed your views in any way? Please explain.

**Have you observed any patterns? Please explain.

**Were advancements made by the Global Community? Please explain.

Summation: Race v. ethnicity and the correlation between the three communities presented in class namely biotic, individual scholarship to create global scholarship.

* No group final response.

** Depending on models used questions may or may not be incorporated.

EG. May 4, 2004.

WoS\Lessons by Session\session ten.1.doc